Appendix J

APPENDIX J

Procedures for Leak Checking Source-Sampling Trains

I. Purpose

To ensure that the sample collected is representative of the source the sampling train must be leak free. All sampling trains used by or on behalf of California Air Resources Board (ARB) for the collection of any samples must be checked for leaks before and after each test. The following are some suggested procedures for performing these leak checks.

II. Assembling Train Components

At the testing site the sampling train components are assembled carefully to ensure that all connections are air tight and leak-free. All ground-glass ball and socket connections must be clamped together with positive-lock pinch clamps. A light coating of silicone grease is applied to the outer portion of the male ground-glass joints. If tygon rubber or teflon tubing is used for connecting impingers or other components, the internal diameter of the flexible tubing should be one eighth of an inch less than the outer diameter of the mating fixture.

Sampling equipment mounted in a mobil monitoring van is particularly vulnerable to vibrations. In this case all sample line connections should be rigid screw type, otherwise screw clamps which compress an airtight seal at all connections must be used.

Spring clamps and clips may not be used to secure connections on a mobil installation unless the items being connected are securely mounted or clamped in place so as to exclude the imposition of tension on the joint.

III. Leak Checks

Prior to use in the field individual train components (e.g., meters pumps) should be checked for internal leaks by applying air pressure. All leak checks of the assembled train or monitoring system must be performed at the test site. Both positive (pressure) and negative (vacuum) leak checks should be performed, if applicable. When the pump is located at the rear end of the train, the entire train is operated under a vacuum. Occasionally the pump is located immediately ahead of the dry gas meter in which case the sample lines, ahead of the pump are under vacuum and the section between the pump and meter is under positive pressure. The pressure portion of the train may easily be checked by the application of air

pressure. For most applications the vacuum leak check is the primary check which must be performed on the assembled train.

A. Leak checks are performed just prior to and immediately following the completion of each test. A vacuum leak check on an EPA type integrated sampling train should be performed as follows:

1. Plug intake nozzle with an air tight stopper.

2. Turn on the pump.

3. Turn the coarse adjustment valve on the console (meter box) to the off position and open the fine-adjust valve until the vacuum gauge reads 15 inches of mercury. After the dial has stabilized, the flow rate should stop. If a flow rate in excess of 0.01 cubic feet during 30 seconds is observed the leak or leaks must be found and corrected.

4. If the leak rate is found to be satisfactory, the plug is first slowly removed from the nozzle after which the pump is turned off. This procedure prevents water from the impingers from being forced backward into the filter.

B. Grab Sampling Trains

Leak checks must be performed on all grab sampling trains before and after use. The leak checks must be performed at the test site.

The components are assembled carefully to ensure a leak-free assembly. During the leak test it is necessary to measure both the vacuum and the flow-rate. To facilitate frequent leak checks a special prefabricated panel including a rotometer and a sensitive vacuum gauge is included with each sampling train. To perform a leak check, this panel is inserted just ahead of the pump or aspirator. The sample probe inlet is plugged and air is slowly evacuated until a vacuum of one inch of mercury is reached. The bi-pass valve on the pump is opened slowly and the vacuum is adjusted so as to maintain a vacuum of one inch of mercury. After stabilization the vacuum must be maintained for a period of one minute.

The sampling train configuration will dictate the type of leak test that has to be performed e.g., pressure leak tests must be performed on that portion of the train which will operate under pressure during the test. Leak checks shall be conducted in such a manner as to demonstrate effective leak-free performance of all

connections, valves, sample lines and impingers through which the gas sample must pass before being measured by a meter.

IV. Records

The engineer or technician in charge must verify that he has performed or observed the leak test by completing and signing the appropriate Leak Test Record. A complete leak check record must accompany all field data.

(see attached)